

SOME OBSERVATIONS ON A HONEY POSSUM (*TARSIPES SPENSERAE*) IN CAPTIVITY

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INTRODUCTION

The small marsupial, *Tarsipes spenserae*, known variously as Honey Possum, Honey Mouse or Noolbenger, has been the subject of infrequent comment and observation since first described by Gray in 1842. Despite accounts of capture and subsequent general notes on habits by Troughton (1923) and Glauert (1928), a brief reference by Shortridge in 1909 to the then-known distribution of the animal, and Ride's (1970) remarks including extent of present habitat, little in the way of specific data has appeared to provide detailed information as to the necessary conditions and diet for maintaining a captive animal in good health while studies are carried out, and behaviour patterns emerging over a sustained period of observation.

It is worth noting that whereas Shortridge (*ibid*) reported that *Tarsipes* was found at that time "in the extreme coastal districts of the South-west", and Troughton (*ibid*) concluded that the area of distribution was decreasing even within the previously stated range, in recent years it has been established that Honey Possums exist not only as far south-east as Duke of Orleans Bay (W.A. Mus. sp. M5025), but well north of Perth, the Kalbarri National Park being the most northerly point thus far which has yielded a specimen (W.A. Mus. sp. M7895)—see Fig. 1. Yet even with the

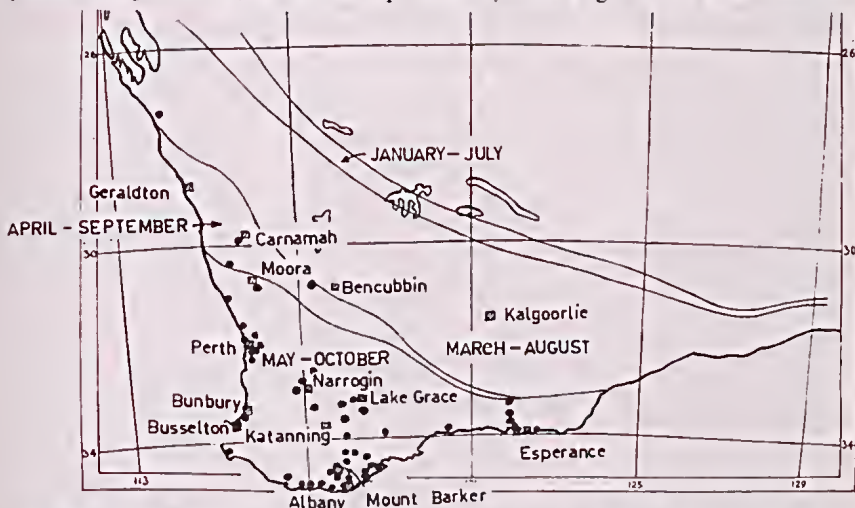


Fig. 1—Distribution of *Tarsipes spenserae* on map showing winter rainfall (April-October). Between the outer rim of April-September belt and the coast, lie the main sand-heath areas of South-Western Australia.

enlargement of the area in which *Tarsipes* is now known to exist, and the occasional references which appear from time to time—e.g. Glauert (1958) and Keast (1960)—there is still a dearth of published material about this marsupial.

When it was learned that a female *Tarsipes* had fallen into the pool at Yanchep National Park, Western Australia, and had been rescued by Mr. John Elphinstone, the opportunity was taken to add to previous studies and the animal was brought to the University of Western Australia on 2 February, 1970, for close and detailed observation.

MATERIALS AND METHODS

A cage was constructed, with measurements of two feet one inch long,

by two feet high, and six inches in width. One wall was of mesh flywire and the opposite wall of clear perspex, with a sliding door ten inches square set in the centre. A feeding shelf was placed six inches from the top of the cage, and at one end a circular hole was cut into the outer wall, giving access to a small nesting box measuring six inches by four inches and having a lining of tiny twigs and leaves.

To assess water evaporation, a petri dish containing 6 mls. of water was placed on top of the cage and an identical dish for drinking water, together with containers for meal worms, golden syrup and a honey mixture (honey, water, prolac and pentavite) was set on the feeding shelf (see section on husbandry for quantities). A branch was positioned in such a way that it rested against the shelf near the nesting box, and an activity wheel of four inches diameter was also put into the cage. Fresh native blossom was placed on the floor of the cage every day in the late afternoon, when the feed dishes were refilled (see Table 1).

TABLE 1.—List of blossom offered with notes on the response of *Tarsipes spenserae* to each variety, from 2/2/70 to 9/7/70. Note that there was present in the cage at all times a consistent supply of food supplement.

Name of blossom	No. of times offered	No. of times accepted (eaten)	Nature of response: excited accepted calmly ignored positively rejected
<i>Callistemon speciosus</i>	48	48/48	excited/accepted
<i>Banksia attenuata</i>	5	5/5	accepted
<i>Banksia menziesii</i>	52	50/52	excited ignored twice
<i>Leptospermum laevigatum</i>	4	4/4	excited
<i>Banksia sphaerocarpa</i>	9	9/9	excited/accepted
<i>Eucalyptus erythrocorys</i>	3	3/3	excited
<i>Eucalyptus calophylla</i>	8	8/8	accepted
<i>Eucalyptus fieffolia</i>	12	12/12	accepted
<i>Eucalyptus marginata</i>	68	65/68	excited/accepted
<i>Eucalyptus torquata</i>	29	29/29	excited
<i>Hakea laurina</i>	6	6/6	accepted
<i>Grevillea exeelsior</i>	8	8/8	accepted
<i>Eucalyptus robusta</i>	1	—	positively rejected
<i>Dryandra floribunda</i>	1	—	ignored
<i>Hakea buceulenta</i>	1	1	accepted

During the first eight weeks, some experimentation took place regarding the amount of blossom offered, as there was no specific indication in any published material as to the necessary daily quantity of either blossom or feed supplement.

The behaviour of the Honey Possum was observed and recorded at least once per hour between 9 a.m. and 5 p.m. every week day and for up to 2-3 hours at a time during weekends for the first eight weeks, together with three occasions when nocturnal activities were watched and each movement documented for 3-3½ hours each time. Following this eight week period, day-time recordings were made at every opportunity and three further sessions of nocturnal watching, for 3 hours at a time, took place. To achieve the latter end, a clear, 10-watt electric bulb covered by a shade was kept burning in the room not only on the night when the observations were to be made, but for the preceding night and late afternoon as well. As this light appeared to have no effect on the animal, no other lights of varying colours were used. It was thus possible to see movements throughout the night, despite the difficulties of the size and noiselessness of the animal. The room temperature was maintained between 15°-23°C.

RESULTS

TABLE 2.—PATTERN OF ACTIVITY PERIODS THROUGHOUT EACH 24 HOURS

Day-time: a.m.											
p.m.											
6.1-6.59	7.0-7.59	8.0-8.59	9.0-9.59	10.0-10.59	11.0-11.59	12.0-12.59	1.0-1.59	2.0-2.59	3.0-3.59	4.0-4.59	5.0-6.0
***	***	*	*	*	*	*	*	*	*	**	**
Night-time: p.m.											
a.m.											
6.1-6.59	7.0-7.59	8.0-8.59	9.0-9.59	10.0-10.59	11.0-11.59	12.0-12.59	1.0-1.59	2.0-2.59	3.0-3.59	4.0-4.59	5.0-6.0
***	**	*	*	*	**	***	**	*	*	*	**

- * = No activity
- ** = a little activity
- *** = sustained activity

From the above table, it can be seen that sustained movement occurred during three main periods every 24 hours—the first in the early pre-dawn to sunrise hour, the second in the late afternoon to early evening, and the third between 11.30 p.m. and 12.45 a.m. Day-time activity was of a limited nature, being almost totally confined to the few minutes in the late afternoon when feeding dishes were refilled and fresh blossom placed in the cage. The daily presentation of the native flowers not only disturbed the animal from resting, but also appeared to excite its curiosity, as no doubt did the heavy scent of honey, markedly noticeable with *Eucalyptus torquata*, *Eucalyptus marginata* and *Leptospermum laevigatum*, with the result that the resting time would be abandoned and a rapid but thorough investigation of the flowers immediately undertaken. The long, protrusile, brushed tongue

(see Fig. 2) flashed out first to gather pollen from stamens, and then was buried deep into the heart of each flower to extract the honey. Bearing in mind the natural environment of *Tarsipes* in the wild, every effort was made to ensure that a *Banksia* flower was always offered. On one notable occasion (9/4/70) when sprays of *Eucalyptus torquata* and *Eucalyptus erythrocorys* were placed in the eage for the first time, the animal rushed from one



FIG. 2.—Dorsal view of tongue of *Tarsipes spenserae* x 20.

flower to another, eating so rapidly that the elongated snout became covered with pollen, as did the fore feet. At this point the tiny creature paused, gripped the left fore foot firmly with the right, and licked off the excess pollen, the same procedure then being carried out for the right fore foot. The eating process was resumed when both fore feet were completely clean. The foregoing occurred despite the presence of four observers.

During the first eight week period of experimentation with the amount of blossom offered, the weight of the animal fell from 9.75 grams to 7.63 grams, but thereafter the diet appeared to adequately cover all nutritive needs, as seen by the steady weight increase and stabilisation (see Table 3).

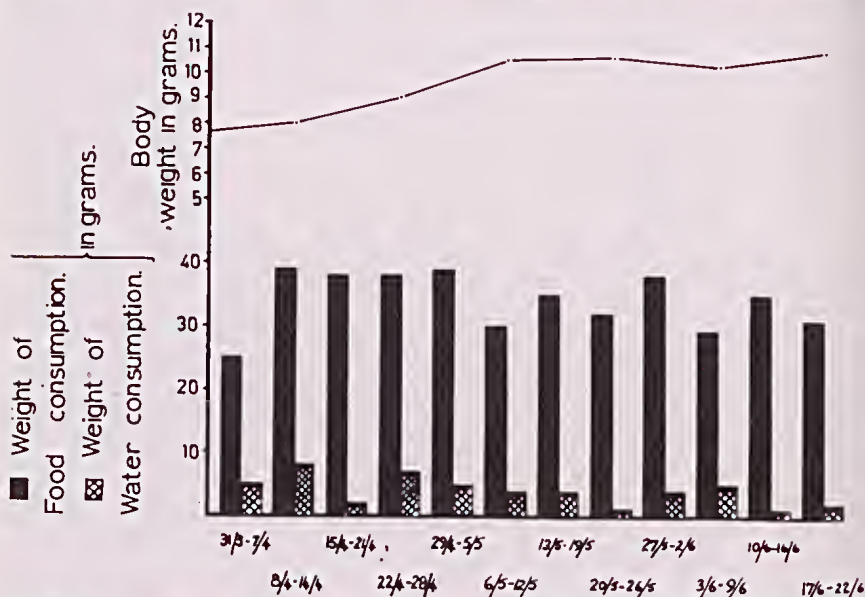


TABLE 3.—Weight of animal and consumption of food supplement and water from 31/3/70—22/6/70 showing recovery from weight loss and subsequent stabilisation.

Behaviour of an investigatory nature consisted of standing in an upright position with ears twitching and nose quivering, the head frequently swaying from side to side (this was particularly noticeable when people were close to the cage), and sniffing—at feeding times, or when suddenly approached by observers. When resting, both day and night, the Honey Possum crouched with eyes half-closed, very often gently quivering all over, or else lay in a ball, with tail curled around the body, the eyes then being either fully open or fully closed, but no movement taking place.

Pouch cleaning occurred both in the early morning and late at night, and appeared to be a part of the feeding cycle: that is, after the animal had climbed around the blossom for perhaps 10-15 minutes, it would remain in one place and spend 3-4 minutes licking the pouch. It would then silently leap up the branch leading to the feeding shelf, where following another 10-12 minutes of rapidly licking up the honey mixture and some water, further scratching and pouch-cleaning would be observed. Grooming would occur occasionally during the day between 9-10 a.m.

Meal worms from the container on the feeding shelf were eaten in the early morning (5.30-7.0 a.m.) and the animal would sometimes remain curled up in the meal worm dish for 4-5 hours.



FIG. 3.—*Tarsipes spenserae* among blossoms of the marri, *E. calophylla*.

On three occasions the activity wheel was seen to be used, each time between 11.50 p.m.-12.30 a.m. The Honey Possum would leap from the branch directly across the cage onto the wheel, thus providing the needed impetus to set it in motion, and thereafter would follow a spirited display of running, climbing and rocking both in and around the wheel. Pauses of 5 seconds to 2 minutes in length would occur as the animal rested, then reactivation of the wheel would take place by means of a rocking motion.

Selection of a diurnal sleeping site was influenced by the type of shelter provided by the leaf cover in the cage, so that if there was only a

small amount of greenery with the blossom, the sleeping site tended to be either the nesting box or the underside of a banksia flower, and conversely if a leafy spray of flowers was lying in the cage, a sleeping position beneath the leaves was favoured. The animal was never seen to sleep in the open without some type of shelter. Yct compared with the behaviour of the Honey Possum observed by Gilbert (Whittell, 1954) which, he recorded "... would occasionally show itself for a few minutes during the day . . ." the animal currently under study was in full or partial view for extended periods of the day-light hours.

Sudden noise would bring an instant response, with evidence of fear in the cowering, hunched-up stance assumed. An increase in the noise level produced frenzied behaviour, with wild leaping from one side of the cage to another, and flinging of the body against the walls. On the single occasion this inadvertently occurred, it was three hours and 45 minutes before the animal recovered sufficiently to approach the fresh food and blossom. Stress was also noticeable when the cage was periodically scrubbed out, but recovery never took longer than 20-24 minutes, and feeding from the blossom followed immediately after.

HUSBANDRY

Following on from Glauert (1958) who gave a general outline of diet, it was found that the survival of the Honey Possum in a healthy state entailed the following feeding routine, with the blossom being offered first, then water changed, and finally the honey mixture renewed and meal worms added if necessary.

Each day:

- 6 mls. water in watchglass
- Dish containing meal worms checked
- Fresh native blossom (see Table 1).
- At least two different varieties, e.g.
 - 4 *Callistemen speciosus* plus 1 *Banksia*
 - or
 - 1 handful *Eucalyptus torquata* plus
 - 3 *Grevillea excelsior*.

Every second day: in addition to the above, the following supplement was offered:

- 8-10 grams honey
- $\frac{1}{2}$ teaspoon prolac
- 1 drop of Pentavite
- 4 mls. water.

In the summer months, 7.5 grams of golden syrup was offered every three days, but as the winter approached this was barely touched, and consumption ceased as the treacle-like substance became almost solid in the cold weather.

Protein is an important factor in the diet, hence the availability of meal worms (or moths) and prolac.

DISCUSSION

It may eventuate that the species will yet be found anywhere within the winter rainfall, sand-heath region of Western Australia where a year-round supply of native blossom is produced. It is suggested that this animal is especially adapted to cross-pollinate flora by means of pollen adhering to its feet and nose in the course of its feeding activity, and the swift movement from flower to flower. Studies along these lines could well prove fruitful.

So much is yet unknown about the life cycle, including oestrus, breeding season and life expectancy of this small marsupial. The weight fluctuations and behavioural variations need to be studied more closely. Further observations on a colony of Honey Possums bred in captivity would

be of inestimable value in adding to the data already published and, contrary to widely-held opinion, it would appear from this present study that *Tarsipes spenserae* is not only easy to maintain in captivity, but worthy of far greater attention than it has hitherto received.

ACKNOWLEDGEMENTS

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FROM FIELD AND STUDY

A Note on the Feeding Habits of a large Deep Water Volutid Gastropod *Cottonia nodiplicata*—a specimen of *Cottonia nodiplicata* (Cox, 1910) trawled in November 1970 by H.M.A.S. *Diamantina*, Cruise DM 1/70, from 60 fathoms off Mandurah, W.A. (32° 33' S, 115° 04' E) has provided the first information on the food of this species.

In the laboratory aboard the vessel the collector (B. R. Wilson) observed the animal (with a shell length of 44 cm) defaecate a mass of calcareous material. This was preserved and examined later. The bulk of the material consisted of the remains of three species of starfishes. Most plentiful were skeletal plates of *Stellaster inspinosus*; there were also plates and spines of *Astropecten* sp. and a few plates and spherical tubercles of an undescribed species of *Asterodiscus*. The latter starfish has also been dredged from the same area.

About one sixth of the total material consisted of sand, containing Foraminifera, silicious sponge spicules, fragments of echinoid test and spine, Bryozoa and Mollusca. There were also several small whole gastro-